

ABSTRACT OF THE DISCLOSURE

In accordance with the present invention, a method for forming a crystalline silicon nitride layer, includes the steps of providing a crystalline silicon substrate with an exposed surface, precleaning the exposed surface by employing a hydrogen prebake and exposing the exposed surface to nitrogen to form a crystalline silicon nitride layer. Also, a trench capacitor, in accordance with the present invention, includes a crystalline silicon substrate including deep trenches having surface substantially free of native oxide. A dielectric stack, including a crystalline silicon nitride layer, is formed on the sidewalls of the trenches. The dielectric stack forms a node dielectric between electrodes of the trench capacitor.